

## REMARKS

Claims 1-16 are pending. Claims 17-34 are withdrawn from consideration.

### Rejections Under 35 U.S.C. § 102

The Office action asserts that Hasegawa et al. (JPO English machine translation of JP 11-191647, publication date 7/13/1999) anticipates claims 1, 2 and 9-16 under 35 U.S.C. § 102(b). Applicants respectfully disagree.

The Office action cites section [0017] of the machine translation of Hasegawa '647 as the source of the disclosure that allegedly anticipates independent claim 1. Applicants include herewith as Appendix A an English translation of section [0017] of Hasegawa '647. It is clear from the translation of section [0017] that Hasegawa '647 does not disclose the limitations of claim 1. In particular, claim 1 recites an exchange coupling film with a ferromagnetic layer and an antiferromagnetic layer and that, "in a section of the exchange coupling film in parallel with the thickness direction thereof, the **crystal grain boundaries** formed in the antiferromagnetic layer and the **crystal grain boundaries** formed in the ferromagnetic layer are **discontinuous** in at least a portion of the interface." (Emphasis added.) Hasegawa '647 does not disclose such an arrangement. Specifically, Hasegawa '647 makes no reference to grain boundaries in the exchange coupling film nor to any discontinuity between them. Applicants also point out that the machine translation cited by the Office action includes no mention of grain boundaries.

Since Hasegawa '647 does not disclose each and every element of independent claim 1, the reference cannot anticipate the pending claims. Applicants therefore respectfully request that the rejection of claims 1, 2 and 9-16 under 35 U.S.C. § 102(b) be withdrawn.

### Rejections Under 35 U.S.C. § 103

The Office action asserts that claims 3 and 8 are obvious over Hasegawa '647 as applied to claim 1 above and further in view of Gill (U.S. 6,456, 469 B1). The Office action further asserts that claims 4-7 are obvious over Hasegawa '647 and Gill as applied to claim 3 and further in view of Lee et al. (U.S. 5,731,936). Applicants respectfully disagree.

As pointed out in the previous section, Hasegawa '647 does not disclose "in a section of the exchange coupling film in parallel with the thickness direction thereof, the crystal grain

boundaries formed in the antiferromagnetic layer and the crystal grain boundaries formed in the ferromagnetic layer are discontinuous is at least a portion of the interface,” as required by independent claim 1 and dependent claims 2-16. Hasegawa ‘647 makes no reference to grain boundaries in the exchange coupling film nor to any discontinuity between them. Applicants further point out that neither Gill nor Lee et al. discloses grain boundaries in the ferromagnetic and antiferromagnetic layers that are discontinuous at the interface.

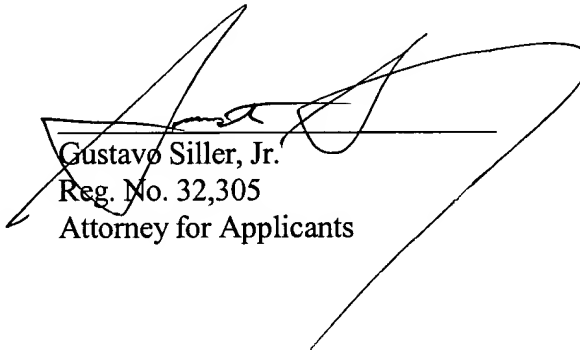
Because the cited references, either alone or in combination, do not teach or suggest each and every element of claims 3-8, a *prima facie* case of obviousness has not been established. Applicants therefore respectfully request that the rejection of claims 3-8 under U.S.C. § 103(a) be withdrawn.



## SUMMARY

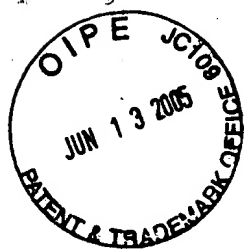
Applicants believe that currently pending claims 1-16 are in condition for allowance. The Examiner is invited to contact the undersigned agent for the Applicants via telephone if such communication would expedite allowance of this application.

Respectfully submitted,



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## APPENDIX A

**English Translation of Section [0017] of Hasegawa '647  
Provided by Mr. Alan Siegrist of Siegrist Translations in Orinda, CA**

[0017]

[Means of Solving the Problem]

The present invention is an exchange-coupled film formed by placing an antiferromagnetic layer and a ferromagnetic layer in contact and performing heat treatment to give rise to an exchange anisotropic magnetic field at the interface between the antiferromagnetic layer and ferromagnetic layer, and the direction of magnetization of the ferromagnetic layer is fixed in a certain direction, wherein: the antiferromagnetic layer is formed from antiferromagnetic material containing at least Mn and the elements  $X$  (where  $X$  is one or two or more elements selected from a group consisting of Pt, Pd, Ir, Rh, Ru and Os), and the structure of the interface between the antiferromagnetic layer and ferromagnetic layer is a disordered state.